

Remarks:

This is in response to the Office Action dated November 20, 2006. Claims 1-8, 11-17 and 19 are pending in the application. Claim 19 is withdrawn. Reexamination and reconsideration of the application, as amended, are respectfully requested.

The Office Action rejects claim 1 as anticipated by U.S. Patent No. 6,266,354 to Chino, et al. Applicant submits that the Chino patent does not anticipate claim 1 because claim 1 is directed to a "semiconductor laser element that exhibits self-sustained pulsation in a predetermined output region," while the Chino patent does not describe or suggest a laser element that exhibits self-sustained pulsation. Rather, the Chino patent describes a method for performing dry etching of a III-V group compound semiconductor and identifies as examples the formation of lasers that do not perform self-sustained pulsation.

The present application describes a laser that includes a ridge portion such that the width of the upper surface of the ridge is shaped to be at least 70% of the width of the lower surface of the ridge. The described ridge configuration makes it possible to obtain self-sustained pulsation up to a high output level and self-sustained pulsation within a wide output region. See Application, page 11, lines 8-23. As discussed at application page 15, lines 9-31, the application's inventors conclude that the gain is spread over a wide region in such a structure, so that the peak strength of the gain is suppressed and absorption within the active layer increases, allowing for improved self-sustained pulsation for the laser.

By contrast, the Chino patent describes a structure that is conventionally understood to not allow self-sustained pulsation for a ridge laser. As discussed in the application at page 16, "increasing the width of the upper edges of the ridge portions ... in the prior art will increase the surface area of the portions of the active layers ... in which gain is high, making self-sustained pulsation more difficult to

achieve. In addition, if ... the ridge portions ... are formed by dry etching instead of wet etching ... the crystallinity of the ridge portions ... will deteriorate."

Consequently, claim 1 of the present application distinguishes over the Chino patent by reciting, a "semiconductor laser element that exhibits self-sustained pulsation in a predetermined output region." As discussed above, the Chino patent does not describe a self-sustained pulsation laser and so claim 1 distinguishes over the Chino patent. Moreover, claim 1 would not have been obvious over the cited art, because the process described in the Chino patent and the resulting structure were at the time of the invention understood to be incompatible with self-sustained pulsation ridge lasers such as that described in U.S. Patent No. 6,757,311 to Abe.

The Office Action also rejected claim 1 as obvious over the combination of the Chino patent taken in view of the Abe patent. Applicant respectfully submits that, while the Office Action frames this rejection as the Chino patent taken in view of the Abe patent, the discussion of this rejection makes clear that the Abe patent is the primary reference and the Chino patent is the secondary reference. Regardless, there is no motivation to use the process and resulting structure of the Chino patent with the structure described in the Abe patent.

The Office Action states that the motivation to combine the teachings of the Abe patent with the teachings of the Chino patent is because it would "prevent the formation of an inverted mesa, and avoid reducing device reliability." Applicant respectfully disagrees that such a motivation exists. Inverted mesas do not result from the processing described in the Abe patent. See all of the figures of the Abe patent, which make it abundantly clear that the Abe patent structures do not approach inverted mesas and the wet etching process of the Abe patent does not produce an inverted mesa. Moreover, as explained at page 16 of the present application, the processing of the Chino patent increases damage and was understood at the time of the invention to be completely incompatible with the self-

sustained pulsation laser described in the Abe patent. Since the Abe patent always avoids formation of an inverted mesa, the Chino patent cannot "avoid reducing device reliability" by preventing formation of an inverted mesa.

Applicant consequently respectfully submits that the motivation stated in the Office Action does not exist and the combination therefore would not be made.

In addition, one of ordinary skill in the art would have no expectation that the process and structure of the Abe patent could be modified in light of the Chino patent to produce a working, self-sustained pulsation laser. The Abe patent describes a self-sustained pulsation laser that is formed by wet etching so that the ridge of the Abe laser has comparatively shallowly sloped sidewalls and a narrow width of the top surface of the ridge. By contrast, the Chino patent describes a structure that is conventionally understood to not allow self-sustained pulsation for a ridge laser. As discussed in the application at page 16, "increasing the width of the upper edges of the rider portions ... in the prior art will increase the surface area of the portions of the active layers ... in which gain is high, making self-sustained pulsation more difficult to achieve. In addition, if ... the ridge portions ... are formed by dry etching instead of wet etching ... the crystallinity of the ridge portions ... will deteriorate."

MPEP 2143.02 requires that there be a reasonable expectation of success for a combination to be considered *prima facie* obvious. Here, that is not the case, as the understanding of those of ordinary skill was that the structure and process of the Chino patent was incompatible with the self-sustained pulsation laser of the Abe patent. Consequently, the teachings of the Abe patent would not be modified in light of the Chino patent. Claim 1 and its dependent claims 2-8 distinguish over the Chino patent taken alone or the Chino patent taken in view of the Abe patent. The Abe patent does not meet claim 1's limitations related to the configuration of the ridge of the self-sustained pulsation laser. The Chino patent does not describe a

self-sustained pulsation laser and so does not meet claim 1's recitation for a self-sustained pulsation laser. The Chino patent describes a structure and process that was understood to be incompatible with self-sustained pulsation lasers so that Chino patent would not be combined with the Abe patent and so claim 1 would not be obvious over the two cited patents.

The Office Action's rejection of claim 11 and its dependent claims depends on the same combination of the Abe patent taken in view of the Chino patent. As discussed above, there is no motivation to modify the Abe patent in light of the Chino patent because the Abe patent does not form anything approaching an inverted mesa. In addition, one of ordinary skill in the art would have had an expectation that such a combination would not work and would not produce a self-sustained pulsation laser. Because any combination needs to be based on a reasonable expectation of success, MPEP 2143.02, the Abe patent would not be combined with the Chino patent. Claim 11 and its dependent claims distinguish over both of the Abe patent and the Chino patent individually and the Abe patent and the Chino patent would not be combined so that claim 11 and its dependent claims would not have been obvious over the Abe patent taken in view of the Chino patent.

In view of the foregoing, it is respectfully submitted that the application is in condition for allowance. Reexamination and reconsideration of the application, as amended, are requested.

If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at the Los Angeles, California telephone number (310) 785-4673 to discuss the steps necessary for placing the application in condition for allowance.

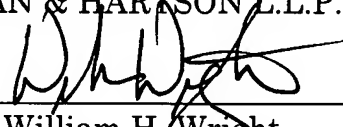
Appl. No. 10/724,570
Amdt. Dated February 7, 2007
Reply to Office Action of November 20, 2006

Attorney Docket No. 81788.0263
Customer No.: 26021

If there are any fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 50-1314.

Respectfully submitted,
HOGAN & HARTSON L.L.P.

Date: February 7, 2007.

By: 
William H. Wright
Registration No. 36,312
Attorney for Applicant(s)

1999 Avenue of the Stars, Suite 1400
Los Angeles, California 90067
Phone: 310-785-4600
Fax: 310-785-4601